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Re: Clearwater Paper Corporation in Lewiston, Idaho -- Required Testing Pursuant to EPA Request for Information, July 19, 2013

On behalf of Clearwater Paper Corporation (CLW) and in accordance with paragraph #3 of EPA's Request for Information (RFI), Horizon Engineering submits this Advance Notification that Horizon Engineering is scheduled to perform required testing at the above-referenced facility beginning the week of April 7, 2014. This also serves as the Test Plan, unless EPA notifies Horizon Engineering at least 5 days prior to the proposed test date of April 7, 2014 The elements required by EPA in the RFI for inclusion in a Test Plan are presented below.

1. **Sources To be Tested:** Internal process points associated with the M&D No. 1 and M&D No. 2 Digesters

2. **Test Locations:**
   - Sample Point 1A: M&D No. 1 Exhaust to Kone Bin
   - Sample Point 2A: M&D No. 1 Exhaust to Kone Bin
   - Sample Point 1B: M&D No. 2 Exhaust to Kone Bin
   - Sample Point 2B: M&D No. 2 Exhaust to Kone Bin

3. **Purpose of the Testing:** Compliance with the RFI and extension granted on August 28, 2013. After observing the pre-test feasibility study and receiving the results, EPA revised the scope of sampling by eliminating Sample Points 3 and 4 on each of the digesters. In accordance with EPA's response letter, dated February 20, 2014, testing Sample Points 1 and 2 is required no later than 60 days from the date of the letter.

4. **Process Description:**

Figure 1 - Process and Sample Point Diagram (See P&I diagram for additional details)

The sawdust pulping system includes two M&D continuous digesters, each operating at approximately 250 ADT/day of equivalent bleached pulp production. Two sawdust storage silos pneumatically feed sawdust to the top of a cyclone separator, where the wood and transport air are separated. On each line, the wood drops into a storage vessel known as the Kone bin, located below the cyclone. Each Kone bin typically contains 10 to 15 feet of wood during normal operation.

On each line, sawdust gravity feeds from the Kone bin into a metering screw, which feeds a rotary inlet valve known as the Bauer valve, before dropping into the digester itself. The rotary inlet valve contains 10 pockets. As the pockets rotate they are sealed against the casing of the valve. The seal prevents back-flow from the pressurized digester vessel.

Fresh steam is used in each rotary inlet valve to heat the sawdust, to pressurize the valve pockets, and to help push sawdust out of the valve pockets to purge the pocket. Sawdust then falls by gravity into the digester vessel. The majority of this steam is either discharged into the digester vessel with the sawdust, or is recycled from the discharge side of the valve to the inlet side of the valve via the primary exhaust line. Secondary exhaust from each rotary inlet valve flows to an exhaust chamber, where it is sprayed with a condensing shower of mill water. Any remaining material not condensed and injected into the sawdust through the metering screw will move through two lines into the bottom of the Kone bin. In addition to the secondary exhaust line, a line from the drop chute between the metering screw and the rotary inlet valve also flows to the exhaust chamber. (See Figure 1)

Once the wood enters the digester it falls onto a midfeather separating plate, where it is confined between constantly moving flights. The flights carry the sawdust down the top side of the midfeather, around the lower end of the digester, and then up the bottom half of the divided digester. When the sawdust reaches the top of the digester, it exits out of the discharge nozzle (on the bottom side of the digester) and falls into the surge tube, before going on to the blow tank. From the blow tank the sawdust pulp is washed and screened, prior to a final bleaching operation.

5. **Process Mode of Operation During Testing**: The operating mode during the testing will be at normal operating rates and conditions. The pulp from these digesters will be processed through a 4-stage brownstock washing line, and then through a 4-stage bleach plant. The pulp will be used in the manufacture of bleached paperboard.

6. **Pollutants to be Tested:** Methanol and TRS.[1]

7. **Test Methods to be Used:** Testing will be conducted in accordance with EPA methods in Title 40 Code of Federal Regulations Part 60 (40 CFR 60), Appendix A, July 1, 2011 and the Emission Measurement Technical Information Center's website, Test Methods Section (www.epa.gov/ttn/emc)

   Sample Points 1A, 2A, 1B and 2B:

Flow Rate:	Modified EPA Methods 1A and 2C (S- pitot flow traverses of duct <12") [2]
CO_2 and O_2:	Assume ambient molecular weight 28.96
Moisture:	ODEQ Method 4 (wet and dry bulb temperatures)
Methanol:	Modified EPA Method 308 (non-isokinetic, sorbent tube and impinger train technique with analysis by GC/FID)[2]
TRS:	Modified EPA Method 16A (silonite coated Summa canister with analysis by GC/SCD per ASTM D 5504-08) [2]

8. **Test Method Modifications:**

   Modified EPA Methods 1A and 2C:

   Two flow measurement ports are located at 90° angles on the horizontal ducts for process points 1A, 2A, 1B and 2B. The port location meets EPA Method 1A criteria, but only the side ports can be used for flow testing. The bottom ports cannot be used because when opened for access, process liquid and sawdust pour out. Therefore flow measurements will be taken from one traverse across the duct, through the side ports. The testers will clear the pitot lines as needed.

[1] TRS compounds analyzed will be dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan.
[2] See Section 8.

Significant safety concerns associated with testing the internal process gases through installed ports, as required by the RFI, were noted to EPA during the feasibility testing. In addition, the volatility of the conditions inherent in the process equipment may affect the validity of test results. For example, high moisture is expected to be a significant interference and may limit the ability to maintain a constant sampling rate. To address the safety concerns associated with sampling at the specified process points, CLW installed ports with piping and valves to close off the duct when the ports are open. The testers use a pipe adapter fitted to the outside of the flow ports for pitot access. Having discussed the port configurations and seen them first hand during the pre-test feasibility study, Horizon concludes that the use of an S-type pitot is essential for this testing. Due to the hazards associated with sampling, appropriate protective clothing including a full face canister style respirator will be worn to ensure the testers safety.

Modified EPA Method 308:

A third pipe port (1/4") is available with fittings for sample lines.

The EPA Method 308 sampling train will be modified in the following ways:
- Teflon tubing, fitted on to the pipe port
- Full size impingers, as needed, for moisture removal

Even with the extra empty impingers the high moisture is a significant interference. Maintaining a constant sampling rate will be achieved as reasonable under the conditions. A dry gas sample volume of 60L will be targeted for each run, but the moisture conditions may make this impractical.

Modified EPA Method 16A

This method is for the TRS sampling of various Kraft plant sources. The principal of analysis is to scrub the sample of SO_2, oxidize the remaining TRS compounds, then measure as SO_2. The testing methodology of EPA Method 16A will be adapted for a different analysis technique; dry gas samples will be analyzed according to ASTM D 5504-08, by GC/SCD, for the speciated TRS compounds of interest.

The Modified EPA Method 16A sampling train will consist of:
- Unheated Teflon tubing, fitted on to the pipe port
- Chilled, empty impingers, as needed, for moisture removal
- One 6L silonite coated Summa can for sample collection
- Each 6L Summa can will be fitted with a 1-hour flow controller (calibrated and provided by the analytical lab)

This configuration is applicable because SO_2 is not a concern and the TRS compounds are not soluble enough to be scrubbed out as condensate collects, therefore using citrate buffer and preventing moisture is not necessary. A clean and dry TRS sample may be obtained by placing impingers with a sufficient knockout volume prior to the Summa can.

9. **Quality Assurance/Quality Control (QA/QC):** Method-specific quality assurance/quality control procedures must be performed to ensure that the data is valid. Documentation of the procedures and results will be presented

in the test report for review. Omission of this critical information may result in rejection of the data, requiring a retest. This documentation will include at least the following:

Manual equipment QA/QC procedures: Field crews will operate the manual testing equipment according to the test method requirements. On-site quality control procedures include:

- Operators will perform pre- and post-test leak checks on the sampling system and pitot lines.
- Thermocouples attached to the pitots and probes are calibrated in the field using EPA Alternate Method 11. A single-point calibration on each thermocouple system using a reference thermometer is performed. Thermocouples must agree within ±2°F with the reference thermometer. Also, prior to use, thermocouple systems are checked for ambient temperature before heaters are started.
- Pitots are examined before and after each use to confirm that they are still aligned.
- Pre- and post-test calibrations on the meter boxes will be included with the report, along with semi-annual calibrations of critical orifices, pitots, and thermocouples (sample box impinger outlet and oven, meter box inlet and outlet, and thermocouple indicators).
- Blank reagents are submitted to the laboratory with the samples. Liquid levels are marked on sample jars in the field and are verified by the laboratory.

Modified EPA Method 308 QA/QC procedures: On-site quality control procedures include:

- The silica gel sorbent tube will be removed prior to the final system leak check per Section 8.1.3 of the method.
- Samples will be shipped on ice and arrive at the lab <20°C. The lab to be used is ALS in Kelso, Washington.

Modified EPA Method 16A/ASTM D 5504-08 QA/QC procedures: On-site quality control procedures include:

- The Summa canisters will have an inner silonite coating to preserve the TRS compounds.
- The initial and final Summa canister vacuum pressures will be recorded.
- The Summa canister will be removed prior to system leak checks.
- The probe tip will be removed from the port pipe fitting and the system will be leak checked from the probe tip by attaching a sample pump to the exit of the final impinger.
- One Summa canister of ambient air will be pulled through the sampling train, immediately following a run so that the sample passes though the un-cleaned probe and impingers.
- Based on the assumed constituents of the gas samples, Horizon concludes that they meet the UN description number 3168, Gas sample, non-pressurized, toxic, flammable, n.o.s. UN 3168 is forbidden from transport by air, therefore the Summa canisters will be shipped by ground to the lab (ALS in Simi Valley, CA). Analysis can be expected within 6 to 7 days of sampling.
- The suggested hold time for TRS analysis by ASTM D 5504-08 is a maximum of 7 days.

Audit Sample Requirement:

60.8(g)(1) "No audit samples are required for the following test methods: Methods 3C of Appendix A–3 of Part 60, Methods 6C, 7E, 9, and 10 of Appendix A–4 of Part 60, Method 18 of Appendix A–6 of Part 60, Methods 20, 22, and 25A of Appendix A–7 of Part 60, and Methods 303, 318, 320, and 321 of Appendix A of Part 63."

The EPA Stationary Source Audit Sample Program was restructured and promulgated on September 30, 2010 and was made effective 30 days after that date. The Standard requires that the Facility or their representative must order audit samples if they are available. Currently, accredited Providers offer audit samples for EPA Methods 6, 7, 8, 12, 13A, 13B, 26, 26A, 29 and 101A. If samples are not available from at least two accredited Providers they are not required. The TNI website www.nelac-institute.org/ssas/ will be referred to for a list of available accredited audit Providers and audits.

There are no audit samples available for any of the test methods covered in this test plan. Based on the above, CLW is not required to obtain audit samples for this test program.

10. **Number of Sampling Replicates and their Duration:** Three (3) test runs of approximately 60 minutes at each sample location will be done for each M&D unit.

    The modified EPA Method 308 will be sampled between 200-1000 ml/min for a minimum sample volume target of 60 liters. As stated earlier, high moisture is expected to be a significant interference and may limit the ability to maintain a constant sampling rate.

    The modified EPA Method 16A will be sampled at a constant rate with calibrated flow controllers provided by the lab. Each 6L Summa canister will be fitted with its own 1-hour flow controller.

11. **Chain of Custody:** Chain of custody forms will be completed at the end of each day's sampling and will be included with the samples when shipped to the lab.

12. **Reporting Units for Results:** Methanol results will be expressed as concentrations (ppmv dry basis), as rates (lb/hr), and on a production basis (lb/ton of ODP). Methanol emissions measured at both sampling points on each digester will be added then divided by the production rate of that digester.

    TRS results will be reported as concentration, ppmv dry basis, uncorrected for oxygen.

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16. **Process Data Collected:** Process data will be gathered by the Site Personnel and provided to Horizon for inclusion in the report for the period of time beginning at least 30 days prior to the testing and extend at least 5 days after the testing concludes . EPA requested that the following process data be collected with a minimum frequency of at least one data point per hour. CLW does not collect all of the requested data on an hourly basis. Exceptions are described in Section 19 (Other Considerations).

- Sawdust Mass feed rate (bone dry tons/hr)
- Wood Species (percent)
- Metering screw rate in revolutions per minute (rpm)
- Cooking liquor volumetric feed rate
- Millwater into exhaust chamber volumetric feed rate and temperature
- Digester production rate (tons of oven dried pulp (ODP)/hr)
- Exhaust chamber temperature
- Exhaust condenser temperature
- Any other process parameter used by the facility or testing firm in determining or calculating emission rates in all units of measure required by the Information Request
- The following Bauer Valve parameters:
    1. RPM
    2. Recycled steam pressure

17. **Plant Entry & Safety Requirements:** The test team will follow internal safety policies and abide by any site specific safety and entry requirements.

18. **Responsibilities of Test Personnel:** The test team will consist of one Project Manager and three Technicians.

19. **Tentative Test Schedule:**

    Day 1: Mobilize
    Day 2: Setup
    Day 3: Test M&D No. 1 and setup on M&D No. 2
    Day 4: Test M&D No. 2 and demobilize

20. **Other Considerations:**

Test Feasibility:
As determined during the feasibility study, the scope of testing covered by the RFI covers internal process gas streams that flow within process equipment that is not designed for sampling or testing. Inherent in these process gases are process liquids, process solids, fluctuating temperatures, and fluctuating moisture concentrations. During the pre-test feasibility study, Horizon Engineering concluded that, in light of process conditions, testing is infeasible for locations 1A, 2A, 1B, 2B, without significant modifications to test methods and atypical effort to reduce clogging and saturation prior to sampling. Even with these adjustments, testing results will be dependent upon process conditions and testers' ability to clear ports of steam saturation. Sampling conditions vary with process conditions and therefore testing feasibility cannot be guaranteed. Specifically, during the pre-test feasibility study, Horizon Engineering encountered significant safety, process, and test sampling concerns. Horizon Engineering was able to address these concerns on sample point 1A and collected methanol. Because sampling for methanol was possible on sample point 1A it is assumed that TRS sampling could also be possible at 1A. However, the temperature was 209°F at 1A and 217°F (steam) at 1B. Testing at location 1A was accomplished during the feasibility study, but would not have been at 1B, in the steam saturated condition. Similar temperatures were measured at process points 2A and 2B. The temperature at 2A was 209°F, and at 2B was 213°F (steam). It is physically impossible to collect an air sample from steam, therefore we conclude that testing in all locations during the scheduled test days will be dependent on process conditions at the time.

In the event that unfavorable testing conditions are encountered during the scheduled test days, Horizon Engineering will use reasonable efforts, considering safety and process limitations to collect valid results. Following attempts to use reasonable efforts to address an unfavorable condition, Horizon Engineering may conclude that testing is infeasible and discontinue work. Information regarding Horizon Engineering's attempts for conform to the RFI and test methods will be provided to EPA in the test report.

Process Data Collection Frequency:
- The sawdust mass feed rate will be calculated once per day.
- One sawdust wood species sample will be taken during the performance test. CLW will provide EPA with 2013 wood species data.
- Mill water temperature going to the exhaust chamber will be measured at the header, upstream from the digesters.
- The digester production rate will be calculated.

- Temperature from the exhaust chamber will be measured and recorded daily (as measured at the exterior surface of the pipe).
- Bauer valve parameters that include recycled steam pressure will be recorded at least once per hour and will be approximated from the digester pressure as there is no transmitter on the actual recycle line.

Administrative Notes: Unless notified as provided in paragraph #3 of the RFI, this test plan is considered approved for testing. Horizon requests a letter acknowledging receipt and approval of this plan from EPA.

EPA will be notified of any known changes in test plans prior to testing. Horizon recognizes that significant changes not acknowledged, which could affect accuracy and reliability of the results, could result in test report rejection.

Test reports will be prepared by Horizon Engineering and will include the sampling site descriptions, procedures, process data, all results and example calculations, field sampling and data reduction procedures, laboratory analysis reports, chain of custody documentation, and QA/QC documentation. The QA/QC documentation will include determination of the method detection level for each test method performed. Source test reports will be submitted to you within 60 days of the completion of the field work, unless another deadline is agreed upon. CLW will send one (1) hardcopy of the completed test report to you at the address above.

Any questions or comments relating to this test plan should be directed to me.

Sincerely,

David Bagwell, QSTI
Managing Member
Horizon Engineering, LLC

cc: Rick Wilkinson, Clearwater Paper Corporation
Marv Lewallen, Clearwater Paper Corporation
Bob Pernsteiner, Clearwater Paper Corporation

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